

Notice of Allowability

Application No.

10/032,881

Applicant(s)

TUOMO SYVANNE

Examiner

Shawki S. Ismail

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE received on 24 May 2006.
2. ☒ The allowed claim(s) is/are 1, 3-16, 18-23, 25, and 28 re-numbered 1-23.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of
Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 20060820.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


SALEH NAJJAR
SUPERVISORY PATENT EXAMINER

EXAMINERS AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and /or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such amendment, it must be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Ronald Fish (Reg. No. 28,843) on August 18, 2006.

3. The application has been amended as follows:

4. In the Brief Description Of The Drawings section of the specification on page 10 replace "Figure 5" at line 3 with --Figures 5 A-B-- and replace "Figure 6" at line 4 with --Figures 6 A-B--.

5. Claims 1-4, 10-15, 17-18 and 23-27 have been replaced with the following amended claim 1-4, 10-15, 17-18 and 23-27. Claim 28 has been newly added.

Claim 1. (Currently Amended) A method for handling dynamic state information used for handling data packets, which arrive at a network element node of a network element cluster, said network element cluster having at least two nodes and each node handling separate sets of data packets, said method comprising:

maintaining in a first node a first, node-specific data structure comprising entries representing state information needed for handling sets of data packets handled in said first node, said sets of data packets handled in said first node being different from sets of data packets handled in any other node of said

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network element cluster, and each set of data packets containing data packets related to each other,

maintaining in said first node in addition to said node-specific data structure a second, common data structure comprising at least entries representing state information for data packets handled in at least one other node of said network element cluster, the contents of said common data structure effectively differing from the contents of said node-specific data structure and including copies of all state information entries maintained in a node-specific data structure of said at least one other node and needed for handling sets of data packets in said at least one other node, said entries being maintained according to information on how different sets of data packets are distributed among the nodes of the network element cluster,

dynamically changing distribution of at least one set of data packets from said at least one other node to said first node in the network element cluster, and providing said first node with respective changed distribution information,

in response to said changed distribution information, selecting the state information entries of ~~said~~ at least one re-distributed set of data packets from said second common data structure and transferring them to said first node specific data structure of said first node.

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allocating to each node belonging to said network element cluster certain node-specific distribution identifiers, each node having separate node-specific distribution identifiers allocated to it,

handling at least a plurality of data packets so that a data packet is handled in that node of said network element cluster, to which node a distribution identifier calculated using certain field(s) of said data packet is allocated, and

maintaining in a plurality of entries of said node-specific and common data structures distribution information relating to the distribution identifier, which corresponds to the set of data packets related to the respective entry.

Claim 2. (Cancelled).

Claim 3. (Currently Amended) replace "2" after "claim" at line 1 with --1--.

Claim 4. (Currently Amended) replace "2" after "claim" at line 1 with --1--.

Claim 10. (Currently Amended) replace "2" after "claim" at line 1 with --1--.

Claim 11. (Currently Amended) replace "2" after "claim" at line 1 with --1--.

Claim 12. (Currently Amended) replace "2" after "claim" at line 1 with --1--.

Claim 13. (Currently Amended) replace "2" after "claim" at line 1 with --1--.

Claim 14. (Currently Amended) A network element node of a network element cluster having at least two nodes, said node comprising:

a first data storage,

means for maintaining in said first data storage a first, node-specific data structure comprising entries representing state information needed for handling sets of data packets handled in said node, said sets of data packets handled in said first node being different from sets of data packets handled in any other node of said network element cluster, and each set of data packets containing data packets related to each other in one or more of the following ways: data packets of same packet data connection, data packets of same communication session comprising a plurality of packet data connections, and data packets of a plurality of packet data connections of same secure tunnel,

a second data storage, and

means for maintaining in said second data storage a second, common data structure comprising at least entries representing state information for data packets handled in one other node of said network element cluster, the contents of said common data structure effectively differing from the contents of said node-specific data structure and including copies of all state information entries maintained in a node-specific data structure of said at least one other node and needed for handling sets of data packets in said at least one other node, and said entries being maintained according to information on how different sets of data packets are distributed among the nodes of the network element cluster,

means for receiving changed distribution information dynamically changing distribution of at least one set of data packets from said at least one other node to said node in the network element cluster, and

means for selecting that, based on said changed distribution information ~~selects~~ the state information entries of ~~said~~ at least one re-distributed set of data packets from said second common data structure in said second data storage and transfers them to said first node-specific data structure in said first data storage of said node,

means for receiving a distribution identifiers, which are currently allocated to said node, said distribution identifiers being used for handling at least a plurality of data packets so that a data packet is handled in that node of said network element cluster, to which node a distribution identifier calculated using certain field(s) of said data packet is allocated,

a third data storage for storing said distribution identifiers, and

wherein said means for maintaining the node-specific and common data structures are adapted to maintain in a plurality of entries of said node-specific.

Claim 15. (Currently Amended) A network element node according to claim 14, wherein:

said means for maintaining the node-specific data structure are adapted to add a new entry to said node-specific data structure in said first storage means, and to communicate said new entry to said means for maintaining common data structure,

said means for maintaining the common data structure are adapted to communicate said new entry at least to one other node of the network element cluster, and in that

said means for maintaining the common data structure are further adapted to receive an entry from at least one other node of the network element cluster and to add an entry corresponding to said received entry to said common data structure in said second storage means.

Claim 17. (Cancelled).

Claim 18. (Currently Amended) A network element node according to claim 47 14, wherein:

said means for receiving distribution identifiers are adapted to receive reallocated distribution identifiers,

said means for maintaining the common data structure are adapted to detect a new distribution identifier being allocated to said node due to the reallocation, said new distribution identifier being a distribution identifier not allocated to said

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node at the time of receiving reallocated distribution identifiers, and to identify in the common data structure the entries corresponding to said new distribution identifier, and to communicate said entries to said means for maintaining the node-specific data structure for said entries to be added to the node-specific data structure, and

said means for maintaining the node-specific data structure are adapted to detect an old distribution identifier not being anymore allocated to said node due to the reallocation, said old distribution identifier being a distribution identifier allocated to said node at the time of the reallocation, and to identify in the node-specific data structure the entries corresponding to said old distribution identifier, and to clear said entries from the node-specific data structure.

Claim 23. (Currently Amended) A network element cluster having at least two network element nodes, at least one of said nodes comprising:

a first data storage means,

means for maintaining in said first storage means a first, node-specific data structure comprising entries representing state information needed for handling sets of data packets handled in said node, said sets of data packets handled in said node being different from sets of data packets handled in any other node of said network element cluster, and each set of data packets containing data packets related to each other,

a second data storage means, and

means for maintaining in said second storage a second, common data structure comprising at least entries representing state information needed for handling sets of data packets handled in one other node of said network element cluster, the contents of said common data structure effectively differing from the contents of said node-specific data structure and including copies of all state information entries maintained in a node-specific data structure of said one other node and needed for handling sets of data packets in said one other node, said entries being maintained according to information on how different sets of data packets are distributed among the nodes of the network element cluster,

means for receiving changed distribution information dynamically changing distribution of at least one set of data packets from said one other node to said at least one node in the network element cluster, and

means for selecting ~~that~~ based on said changed distribution information ~~selects~~ the state information entries of said at least one re-distributed set of data packets from said second common data structure in said second data storage and transferring them to said first node-specific data structure in said first data storage means of said at least one node.

means for allocating to each node belonging to said network element cluster certain node-specific distribution identifiers, each node having separate node-specific distribution identifiers allocated to it, said distribution identifiers being used for handling

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at least a plurality of data packets so that a data packet is handled in that node of said network element cluster, to which node a distribution identifier calculated using certain field(s) of said data packet is allocated, and in that said at least one node further comprises:

means for receiving a distribution identifiers, which are currently allocated to said node, and

a third data storage for storing said distribution identifiers, and

wherein said means for maintaining the node-specific and common data structures are adapted to maintain in a plurality of entries of said node-specific and common data structures in said first and second data storage means distribution information relating to the distribution identifier, which corresponds to the set of data packets related to the respective entry.

Claim 24. (Cancelled).

Claim 25. (currently Amended) A network element cluster according to claim 24-23, wherein:

said means for allocating distribution identifiers are adapted to reallocate distribution identifiers to the nodes of said network element cluster, and wherein in said at least one node

said means for receiving distribution identifiers are adapted to receive reallocated distribution identifiers, and

said means for maintaining the common data structure are adapted to detect a new distribution identifier being allocated to said node due to the reallocation, said new distribution identifier being a distribution identifier not allocated to said node at the time of receiving reallocated distribution identifiers, and to identify in the common data structure the entries corresponding to said new distribution identifier, and to communicate said entries to said means maintaining the node-specific data structure for said entries to be added to the node-specific data structure, and

said means for maintaining the node-specific data structure are adapted to detect an old distribution identifier not being anymore allocated to said node due to the reallocation, said old distribution identifier being a distribution identifier allocated to said node at the time of the reallocation, and to identify in the node-specific data structure the entries corresponding to said old distribution identifier, and to clear said entries from the node-specific data structure.

Claim 26. (Cancelled).

Claim 27. (Cancelled).

Claim 28. (New) A computer-readable medium comprising computer-executable components which, when run on a computer, configure the computer to

operate as a network element node of a network element cluster having at least two nodes and each node handling separate sets of data packets,

maintain in said network element node a first, node-specific data structure comprising entries representing state information needed for handling sets of data packets handled in said network element node, said sets of data packets handled in said network element node being different from sets of data packets handled in any other node of said network element cluster, and each set of data packets containing data packets related to each other,

maintain in said network element node in addition to said node-specific data structure a second, common data structure comprising at least entries representing state information for data packets handled in at least one other node of said network element cluster, the contents of said common data structure effectively differing from the contents of said node-specific data structure and including copies of all state information entries maintained in a node-specific data structure of said at least one other node and needed for handling sets of data packets in said at least one other node, said entries being

maintained according to information on how different sets of data packets are distributed among the nodes of the network element cluster,

receive changed distribution information dynamically changing distribution of at least one set of data packets from said at least one other node to said network element node in the network element cluster,

select based on said changed distribution information, the state information entries of at least one re-distributed set of data packets from said second common data structure and transfer them to said first node-specific data structure of said network element node,

receive distribution identifiers, which are currently allocated to said node, said distribution identifiers being used for handling at least a plurality of data packets so that a data packet is handled in that node of said network element cluster, to which node a distribution identifier calculated using certain field(s) of said data packet is allocated, and

maintain in a plurality of entries of said node-specific and common data structures in said first and second data storage distribution information relating to the distribution identifier, which corresponds to the set of data packets related to the respective entry.

REASONS FOR ALLOWANCE

6. The following is an Examiner's Statement of Reasons for Allowance:

Claims 1, 3-16, 18-23, 25, and 28 are allowable over the prior art of record.

This communication warrants no examiner's reason for allowance, as applicant's reply makes evident the reason for allowance, satisfying the record as whole as required by rule 37 CFR 1.104 (e). In this case, the substance of applicant's remarks in the amendment filed on 24 May 2006 with respect to the amended claim limitations and further amended claim limitations in the Examiner's Amendment filed on 20 August 2006 point out the reason claims are patentable over the prior art of record. Thus, the reason for allowance is in all probability evident from the record and no statement for examiner's reason for allowance is necessary (see MPEP 13202.14).

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submission should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawki S Ismail whose telephone number is 571-272-3985. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saleh Najjar can be reached on 571-272-4006. The fax phone number for

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the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shawki Ismail
Patent Examiner
August 20, 2006



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SUPERVISORY PATENT EXAMINER